

# MJE3439

## NPN Silicon High-Voltage Power Transistor

This device is designed for use in line-operated equipment requiring high  $f_T$ .

### Features

- High DC Current Gain –  $h_{FE} = 40-160 @ I_C = 20 \text{ mAdc}$
- Current Gain Bandwidth Product –  $f_T = 15 \text{ MHz (Min) @ } I_C = 10 \text{ mAdc}$
- Low Output Capacitance –  $C_{ob} = 10 \text{ pF (Max) @ } f = 1.0 \text{ MHz}$
- Pb-Free Package is Available\*

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	350	Vdc
Collector-Base Voltage	$V_{CB}$	450	Vdc
Emitter-Base Voltage	$V_{EB}$	5.0	Vdc
Collector Current – Continuous	$I_C$	0.3	Adc
Base Current	$I_B$	150	mAdc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	15 0.12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$\theta_{JC}$	8.33	$^\circ\text{C/W}$

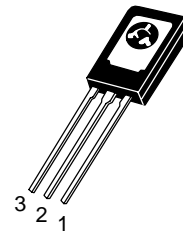
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.



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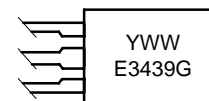
<http://onsemi.com>

**0.3 AMPERE  
POWER TRANSISTOR  
NPN SILICON  
350 VOLTS, 15 WATTS**



**TO-225  
CASE 77  
STYLE 1**

### MARKING DIAGRAM



Y = Year  
WW = Work Week  
E3439 = Device Code  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
MJE3439	TO-225	500 Units/Box
MJE3439G	TO-225 (Pb-Free)	500 Units/Box

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MJE3439

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage ( $I_C = 5.0\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	350	–	Vdc
Collector Cutoff Current ( $V_{CE} = 300\text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	–	20	$\mu\text{A}$
Collector Cutoff Current ( $V_{CE} = 450\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ )	$I_{CEX}$	–	500	$\mu\text{A}$
Collector Cutoff Current ( $V_{CB} = 350\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	20	$\mu\text{A}$
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	20	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = 2.0\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 20\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ )	$h_{FE}$	30 15	– 200	–
Collector–Emitter Saturation Voltage ( $I_C = 50\text{ mA}$ , $I_B = 4.0\text{ mA}$ )	$V_{CE(sat)}$	–	0.5	Vdc
Base–Emitter Saturation Voltage ( $I_C = 50\text{ mA}$ , $I_B = 4.0\text{ mA}$ )	$V_{BE(sat)}$	–	1.3	Vdc
Base–Emitter On Voltage ( $I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ )	$V_{BE(on)}$	–	0.8	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current–Gain – Bandwidth Product ( $I_C = 10\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 5.0\text{ MHz}$ )	$f_T$	15	–	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ob}$	–	10	pF
Small–Signal Current Gain ( $I_C = 5.0\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{fe}$	25	–	–

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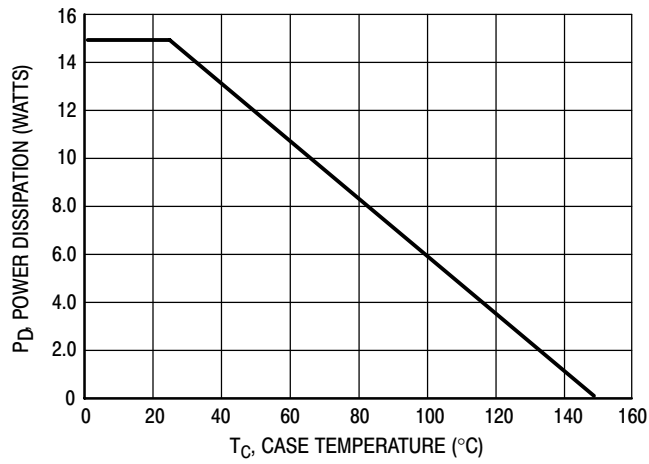


Figure 1. Power-Temperature Derating Curve

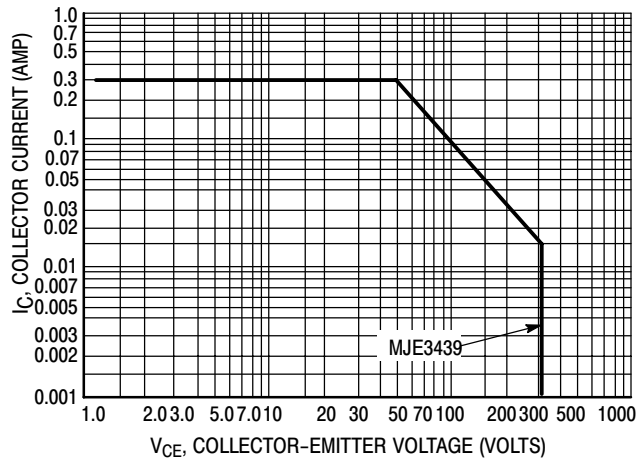


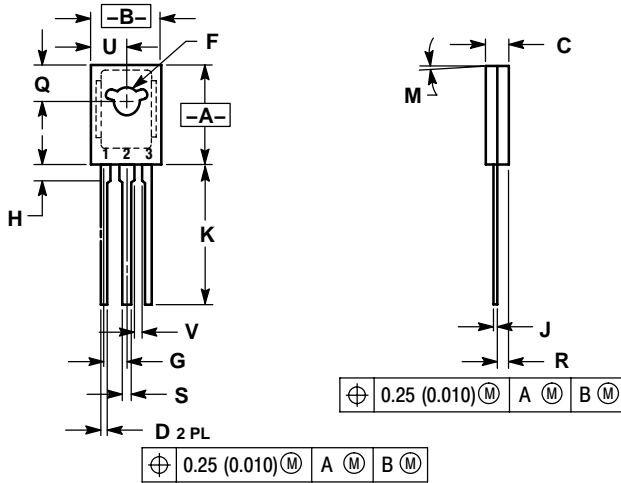
Figure 2. Active-Region Safe Operating Area

The Safe Operating Area Curves indicate  $I_C - V_{CE}$  limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum  $T_J$ , power-temperature derating must be observed for both steady state and pulse power conditions.

# MJE3439

## PACKAGE DIMENSIONS

TO-225  
CASE 77-09  
ISSUE Z



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 077-01 THRU -08 OBSOLETE, NEW STANDARD 077-09.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.425	0.435	10.80	11.04
B	0.295	0.305	7.50	7.74
C	0.095	0.105	2.42	2.66
D	0.020	0.026	0.51	0.66
F	0.115	0.130	2.93	3.30
G	0.094 BSC		2.39 BSC	
H	0.050	0.095	1.27	2.41
J	0.015	0.025	0.39	0.63
K	0.575	0.655	14.61	16.63
M	5° TYP		5° TYP	
Q	0.148	0.158	3.76	4.01
R	0.045	0.065	1.15	1.65
S	0.025	0.035	0.64	0.88
U	0.145	0.155	3.69	3.93
V	0.040	---	1.02	---

### STYLE 1:

1. EMITTER
2. COLLECTOR
3. BASE

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